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REGIONS OF CRIMINAL MOBILITY¹

INTRODUCTION TO A DETROIT STUDY

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It is becoming more and more evident that the problem of crime can be neither theoretically conceived nor practically controlled as a local phenomenon. Beginning with the introduction of the automobile at the turn of the century, our whole social life has been evolving a new territorial character. Two basic changes have occurred: human mobility has increased in amount and altered in kind, and population has become distributed in a new settlement structure fundamentally different from that of the pre-automobile era. In spite of this transition, political boundaries remain unchanged and are still used for administering government services, including the collection of criminological data and the jurisdiction of agencies of crime control. It is the general consensus that the efficient operation of these particular services is restricted by antiquated political confines, and that an adjustment to modern conditions must soon be made. But there is little agreement concerning a specific and objective technique for territorial realignment. The present investigation proposes to determine whether criminal phenomena have a spatial pattern, and, if so, how boundaries of criminal interaction may be delineated.

Popular impression has it that "crime knows no boundaries." But this belief is challenged by the discovery that boundaries (not political) circumscribe social conditions other than crime, that many aspects of contemporary life have a degree of spatial regularity and occur in areas that tend to be internally homogeneous and externally unique. Such unit-areas are called one of several kinds of region. Thus, political-party regions are delineated upon the basis of election returns, sectional regions on the basis of given

¹ Based on a doctoral dissertation, Department of Sociology, University of Michigan, June, 1936. I am deeply indebted to Professors R. D. McKenzie and A. E. Wood who directed the study; to Professors H. F. Adams, R. C. Angell, and J. B. Waite who served on Committee; to Professors R. E. Park, University of Chicago, and E. H. Sutherland, University of Indiana, who offered many helpful suggestions.

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historical traditions shared in common, and metropolitan regions on the basis of their functional integration with particular metropolitan centers. Delineated from these and other factors there are today approximately 100 regional schemes in use.³ *The hypothesis of the present investigation is that criminal phenomena, as an interrelated part of the general social life, have spatial regularity over areas that are larger than cities and are therefore regional.* To demonstrate or refute this proposition requires the analysis of two kinds of data: the mobility of criminals, and the territorial distribution of offenses.

Concrete Statement of the Problem

Criminal mobility is well known. Almost any daily newspaper carries an account of a crime in which the perpetrators fled from the scene in a speeding automobile; posted upon the bulletin boards of most police departments are circulars identifying offenders wanted in other places and advising rewards to be paid for their capture; police radios frequently broadcast to suburban and other places asking cooperation in apprehending fugitives. It is also familiar that moral customs vary between city and country and between different sections of the nation. These general ideas are implied in common parlance, in such phrases, for example, as "sins of the city," "puritanical New England," "pioneer code of the West," "morals are geographical," etc., etc.

A few facts from the career of a recent and widely publicized offender will serve as a concrete statement of the regional problem. The case of John Dillinger is especially suggestive both of criminal mobility and of the relation between the offense and the locale of its occurrence.⁴ Whether or not the case is "typical" is of little concern here, since it is used only as an illustration, and seems to be apt because it is familiar and because Dillinger's frequent elusions of arrest may point to loop-holes in criminological theory and practice. His notorious escapades captured the public eye and brought the usual wave of criticism upon the law enforcement agencies in general and the police in particular. The public response accorded him grew to the enormous proportions of those

³ National Resources Committee, *Regional Factors in National Planning and Development*, Washington, 1935, p. 72.

⁴ A primary source of facts concerning Dillinger is the mimeographed report of the U. S. Department of Justice, Federal Bureau of Investigation, "John Herbert Dillinger, with Aliases; National Motor Vehicle Theft Act," No. I. C. 62-29777, Washington, January 2, 1935. A reliable secondary source is Mildred Adams, "The Evolution of a Criminal: the Case of John Dillinger," *New York Times*, April 29, 1934, Sec. 8, p. 2.

legendary hero-bandits whom Dillinger succeeded in the tradition of the West.⁵

The recorded movements of Dillinger during a period of two months which elapsed shortly before his final apprehension and death are well known. No hypothetical situation is required to illustrate the regional tendencies of present-day crime. The Dillinger case exemplifies three conditions which are the correlative problems of the present research. The first is the spatial pattern of mobility occasioned by Dillinger's use of the automobile. Except for a pleasure trip to Florida and Arizona his movements were largely confined to Illinois, Indiana, and the states adjoining these. Moreover, the movement was not random but was oriented to a dominant center, Chicago. This suggests the possibility that the mobility of criminals in general may occur similarly with reference to metropolitan cities as centers.

The second problem is to determine whether the spatial distribution of offenses has such a pattern. Dillinger worked out of Chicago where are concentrated the specialized services which he required: criminal associates, news, physicians, plastic surgeons, lawyers, cosmeticians—these in addition to recreational opportunities. His anonymity allowed him contact and participation. From Chicago, the transportation center of the area, he plundered the readily available banks and police stations in the surrounding territory. This suggests that if criminals concentrate in large cities then it is possible that distance from cities may function as a factor in the offense rates of outlying areas, that offenses may become less frequent as distance from the city-center increases.

Third, the Dillinger case embraces occurrences which are characteristic of the section of the country over which he operated, but rarely, if ever, take place in certain other sections. The problem is statistically to confirm or reject this as a general tendency.

Only the first of the three problems is investigated in the present report; the others are reserved for future presentation in this *Journal*. The method used here to determine whether criminal mobility has a regional pattern is to describe the areas or distances of criminal movements by comparing them to the regions of mobility of the general population.

⁵ For sensational but none-the-less significant historical antecedents, see *Pat F. Garrett's Authentic Life of Billy the Kid*, M. G. Fulton, Editor, New York, 1927; and Robertus Love, *Rise and Fall of Jesse James*, New York, 1926.

*Regions of Mobility*⁶

Since the concept *region* is usually defined in general flexible terms, it remains to be stated specifically what regional factors the three supposed tendencies have in common. The working definition used in the present study is that a region is an area in which a particular phenomenon is distributed in a regular pattern emanating from an influential center. More exactly, a region is an area dominated by a functional or cultural center and its boundaries are delineated by the distribution of one or more variables which change gradually from the center to the boundary where the trend in an opposite direction begins. Thus, the gradient character of a distribution is the criterion of the region. This requires only that the particular variable increase or decrease regularly with distance from a given center of observation. The particular variables in the three supposed tendencies noted above are criminal mobility and the territorial distribution of offenses, and the given centers of observation are metropolitan cities and traditional sections of the country.

Mobility is a very well known tradition in the United States. But with the growing use of the automobile the character of mobility has changed as has the structure of settlement within which movement takes place. The trend of population distribution is not only towards the city but the city itself is expanding both its area of settlement and its sphere of dominance. With the development of motor transportation the city's population spread into enviroining areas and many new communities were created and brought under its sway of influence. The upshot of the trend has been the breaking down of the pre-automobile distinction between urban and rural communities. In place of these a regional community of settlement and mobility is developing.

There are three regions delineated upon the basis of mobility centering about metropolitan cities. One is the *commutation area*, roughly synonymous with the "built-up" areas surrounding larger cities and corresponding more closely to the United States Bureau of the Census unit, the metropolitan district.⁷ A second and larger

⁶ *Mobility* refers here only to movement in physical or geographic space whether temporary or permanent. Thus it includes only partially and incidentally Professor Sorokin's conception as change in social position (*Social Mobility*, N. Y., 1927) and Professor McKenzie's conception as change in ecological position ("The Scope of Human Ecology," *American Journal of Sociology*, July, 1926, pp. 141-154).

⁷ The U. S. Census, 1930, defines metropolitan districts as including "in addi-

unit is the *metropolitan region* which is approximately the whole-sale-area or trucking-area around the city. Both of these regions are characterized by temporary or routinized mobility. The third and largest type of region is the *inter-state migrations area* which is delineated upon the basis of longer range movements and consists of a group of adjacent states. It is approximately the overnight rail transportation zone and is defined as the area from which most migrants come to a given center.

Since Detroit is the focal point of the present research there follows a brief description of recent trends in settlement with special reference to Detroit and a specific delineation of the three regions of movement centering about Detroit. Finally, to be analyzed in terms of these regions, there will be presented several indexes to the distance factor in the movement of criminals.

Expansion of Urban Settlement

It is important to notice that the trend towards urbanization and towards an increase in the size of the larger aggregates has been generally constant during the past half century.⁸ But with the appearance of the automobile there began a territorial extension of the areas of contiguous urban settlement. The locus of most rapid growth had been first in the centers of the cities, but it subsequently moved out towards the periphery or outlying areas. Figuratively, city populations have been spilling over or spreading out into the surrounding suburbs and satellite cities. This fact is shown by the relative growth of the central cities and outlying parts of metropolitan districts between 1920 and 1930. In over seventy per cent of the 96 metropolitan districts "the area outside the central city had a higher percentage of population increase than the central city itself. In short, as a rule the suburbs and neighboring smaller cities are growing more rapidly than the central cities."⁹ This tendency is plainly evidenced in the Detroit aggregate: the

tion to the central city or cities, all adjacent and contiguous civil divisions having a density of not less than 150 inhabitants per square mile, also, as a rule, those civil divisions of less density that are *directly* contiguous to the central cities, or are entirely or nearly surrounded by minor civil divisions that have the required density." *Metropolitan Districts*, pp. 5, 6.

⁸ The proportion of the population of the United States which is classified as urban doubled from 28.8 per cent in 1880 to 56.2 per cent in 1930 (U. S. Census, 1930, Vol. 2, Table 1, p. 18). In 1880 there were nineteen cities having 100,000 or more inhabitants while in 1930 there were 93 such cities (*ibid.*, Vol. 1, Table 11, pp. 18-21).

⁹ *Metropolitan Districts*, *op. cit.*, p. 6.

growth of Oakland and Macomb counties, which surround Detroit, began later and continued after Detroit's growth had subsided.

The Detroit Commutation Area.—This smallest of the three regions of mobility has been delineated for Detroit by Waldon who recorded automobile traffic counts for a 24-hour period along five principal highway routes entering the city.¹⁰ A distinct gradient character in the pattern of mobility is shown when the combined totals are plotted by distance from the center of the city: the volume of traffic constantly decreases from the center of the city to a point between the forty and forty-five mile circles. At the fifty mile circle a slight increase in traffic volume is recorded. This is due in large part to the increased volume of traffic going to and from the Detroit satellite city of Flint, Michigan.

McKenzie utilizes these facts as a general index to the size of the motor commutation area. "Although the data refer to all types of motor traffic without regard to type of destination, the proportion of private automobiles is sufficiently great to warrant the conclusion that the 40-mile circle, the point of lowest volume, approximates the outer margin of the motor commutation area."¹¹

Since the boundaries of the commutation area have not been as precisely delineated as have those of the metropolitan district, the latter unit is used as a practical expedient in the analysis of the areas of criminal mobility which follows later. It should be noted, however, that the metropolitan district is delineated upon the basis of the density of settlement and is not primarily an area of mobility. But in the case of Detroit, and probably most other cities, the two are practically identical.¹²

The Detroit Metropolitan Region

Metropolitan regions in every part of the country are primarily economic and commercial areas organized around and

¹⁰ *Metropolitan Highways*, Address before the American Association of State Highway Officials at their Sixteenth Annual Convention, Pittsburgh, 1930, p. 11. Cited in, *The Metropolitan Community*, New York, 1933, circa. p. 87.

¹¹ *The Metropolitan Community*, op. cit., p. 88.

¹² Paver and McClintock state the relationship between settlement density and mobility in the following more general terms: "Where light density of population exists, there usually is found light volume of traffic, and, conversely, where there is heavy density of population, there is usually heavy traffic flow. In the heart of the city is found the closely built-up area, where there is a great concentration of population activity; as one reaches the outskirts, having passed through the residential and suburban areas, one comes to the area of scattered population where the density is low. The space distribution of traffic flow is usually found to be approximately similar to the space distribution of population and its activity." *Traffic and Trade*, New York, 1935, p. 7.

dominated by large central cities. Farmers in the rural areas of the region and manufacturers in the satellite cities truck their products into the dominant center to be marketed. Coming out from the center are newspapers, wholesale manufacturers; and often located in the center are the commercial organizations which integrate many activities of the outlying communities. The metropolitan region is an area of which the component parts are functionally interrelated by routes of communication and transportation.

The boundaries of metropolitan regions have been delineated upon the basis of the volume of communication and the transportation of people and commodities to and from the dominant center. McKenzie and Park divided the United States into coterminous metropolitan regions from the circulation data of metropolitan daily newspapers.¹³ Goodé has delineated somewhat different regions on the basis of more general economic and geographic factors.¹⁴ The volume and destination of motor traffic is one of the more important indexes to the boundaries of the metropolitan region. Paver and McClintock conclude from their analysis of the relations between traffic and trade that "the space distribution of total traffic forms definite patterns that indicate the daily habitual movement of population. . . . These patterns graphically express the life blood of any community."¹⁵

The boundaries between the Detroit, Chicago, and Toledo metropolitan regions have been delineated upon the basis of six tests or services.¹⁶ These are newspaper circulation, telephone toll calls, retail parcels-post package deliveries, wholesale grocery shipments, passenger car traffic, and truck traffic. The six services show six only slightly different boundaries of the Detroit metropolitan region. For the purposes of the present study only the boundary drawn upon the basis of passenger car traffic is used. It is almost identical to the Detroit region delineated from newspaper circulation, cited above.

The Region of Inter-State Migrations to Detroit

The commutation area and the metropolitan region are delineated upon the basis of temporary mobility. Larger distances, in

¹³ *The Metropolitan Community*, op. cit., p. 107.

¹⁴ *Recent Social Trends in the United States*, New York, 1933, C. E. Merriam, "Government and Society," Chapter 29, p. 1495.

¹⁵ *Traffic and Trade*, op. cit., p. 28.

¹⁶ K. H. McGill, *Methods for Delineating the Boundary and Integration Zones of Metropolitan Regions*, Ann Arbor, 1935, unpublished MS.

general, are involved in more permanent or migratory movements. United States census statistics of state of birth show that there is a marked tendency for persons to migrate within a given state or to neighboring states rather than for greater distances. In 1930, of the total native population of the United States, 76.5 per cent were living in the state of birth, 11.3 per cent in adjacent states, and 12.2 per cent in all other states.¹⁷ Thus 87.8 per cent were living in the state of birth or in adjacent states. Further evidence of this tendency may be had from the tabulation of state of birth data by *divisions* of states. Each division consists of from three to nine contiguous states.¹⁸ In 1930, 84.6 per cent of the total native population was living in the division of birth.¹⁹ A notable exception is the Pacific division: the more numerous migrations to this division came from the East North Central and West North Central divisions which are not contiguous to it.²⁰ With this exception, however, the general rule holds true for the country at large that the more permanent or migratory movements are included within the range of several adjacent states.

The distance range of migratory movements to Detroit in particular may be indicated by tabulating the residents of the city who were born in other states by state of birth. The twelve states in addition to Michigan from which 10,000 or more persons migrated who were enumerated as residing in Detroit at the time of the census in 1930, are, in decreasing order, Pennsylvania, Ohio, New York, Illinois, Georgia, Indiana, Kentucky, Tennessee, Alabama, Missouri, Wisconsin, Massachusetts. It is notable even though it may be somewhat exceptional and peculiar to Detroit that these states form a contiguous group, that there are no jumps over states that furnished less than 10,000 migrants to Detroit. This area em-

¹⁷ U. S. Census, 1930, Vol. 2, Table 20, p. 152.

¹⁸ The nine census divisions are as follows: (1) New England: Maine, New Hampshire, Vermont, Massachusetts, Rhode Island, Connecticut; (2) Middle Atlantic: New York, New Jersey, Pennsylvania; (3) East North Central: Ohio, Indiana, Illinois, Michigan, Wisconsin; (4) West North Central: Minnesota, Iowa, Missouri, North Dakota, South Dakota, Nebraska, Kansas; (5) South Atlantic: Delaware, Maryland, District of Columbia, Virginia, West Virginia, North Carolina, South Carolina, Georgia, Florida; (6) East South Central: Kentucky, Tennessee, Alabama, Mississippi; (7) West South Central: Arkansas, Louisiana, Oklahoma, Texas; (8) Mountain: Montana, Idaho, Wyoming, Colorado, New Mexico, Arizona, Utah, Nevada; (9) Pacific: Washington, Oregon, California.

¹⁹ With the exception of the Pacific and Mountain divisions there is little variation between divisions. The Pacific division shows the highest proportion born in other divisions, 52.5, and the East South Central division the lowest proportion, 7.5 per cent. *Ibid.*, Table 10, p. 142.

²⁰ *Ibid.*, Table 21, p. 153.

bracing a dozen adjoining states is considered as the region of inter-state migrations to Detroit

Areas of Criminal Mobility

The significant fact that we are keeping before us for the analysis of criminal mobility which follows is that the three regions described above are not arbitrary units. On the contrary, they are delineated factually as zones of diminishing influence and there are quite definite breaks in the volume of mobility which differentiates them. Yet the breaks are not entire or complete. The commutation area shades off into the metropolitan region, the dominance of which gradually decreases to a minimum and thus locates the boundaries between other metropolitan regions dominated by their respective centers. These in turn comprise regions of inter-state migration.

The assumption implied thus far has been that the areas of criminal mobility are not essentially different from the areas of mobility of the general population. Whether or not this assumption is supported by the facts, we know that criminals utilize the same modes of communication and transportation as do non-criminals and therefore the whole condition of criminal mobility is to be interpreted as relative to mobility in the general population. But this relationship must be explicitly established in order to make relevant the foregoing description of general mobility.

An approach may be made towards determining the character of the relationship between the areas of general and of criminal movement by tabulating measures of criminal mobility as occurring within or outside of the regions delineated upon the basis of the mobility of the general population. The five partial measures of the territorial range of criminal movements between Detroit and other places are as follows:

1. A tabulation of locations other than Detroit in which 500 offenders arrested in Detroit during December, 1934, and January, 1935, had arrest records. The data are taken from the records of 500 consecutive individuals in the "photograph file" of the Identification Bureau of the Detroit Police Department. The Bureau photographs persons whose offenses are "serious" in the discretion of the officer in charge at the time; or who are suspected of recently having committed offenses other than the one for which arrested; or who it is thought might commit further offenses in the city; or whose photographs or other photographs in connection with the

crime are required by the prosecutor as evidence in court. It is the routine procedure to obtain the arrest records of such persons in two clearing houses of criminal identification information: the Federal Bureau of Investigation at Washington, and the Michigan State Bureau of Identification at Lansing. A simple tabulation is made of the places of arrest.

2. An enumeration of the places in which offenders with criminal records in Detroit had been apprehended as indicated by letters requesting identification information received by the Detroit Police Department from 1931 through 1935. During the five-year period 2,038 identifications were made in this manner. This does not refer to the total number of letters requesting identification information received of which there were many more than this number; there were 2,038 offenders positively identified in response to letter requests containing finger prints.

3. A count of telegrams sent by the Detroit Police Department to other places during 1935. Each telegram may refer to none or as many as several offenders who may have a criminal record in none or any number of cities. These data are primarily measures of police communications rather than of criminal mobility. The police usually possess the most recent recorded and unrecorded information concerning the whereabouts of offenders, and, moreover, since telegraphic communication is expensive, it is believed to be a usefully reliable index to criminal movements.

4. A count of telephone toll calls made to other places by the Detroit Police Department from December 10, 1933, to December 10, 1934. The same errors operative in the telegraphic communications apply to this series of data as an index to criminal mobility.

5. An enumeration of the places outside of Detroit in which automobiles stolen in Detroit were recovered during the year 1933. This tabulation is perhaps the most objective of the five series and it measures a definite kind of criminal mobility. But, like the others, it has the disadvantage of incompleteness and is not to be construed as being wholly representative.

The table on page 667 summarizes the indexes of criminal mobility by cumulative percentages of criminal and police contacts between Detroit and places in the five regional and non-regional areas. It is immediately apparent from this that the different indexes show wide differences in the range of movement. No telegrams were sent by the Detroit Police to places within the commutation area (metropolitan district) whereas 59.4 per cent of the

telephone calls were made to places within this area. The proportion of the total of 'phone calls made to places within the commutation area is actually larger than 59.4 per cent because several of these cities may be telephoned from Detroit without a toll charge and hence are not recorded. Only thirteen of the 1,406 toll calls, less than one per cent of the total, were made to the 36 states outside of the region of inter-state migrations.

Approximately the same range of movement described by the toll call series is shown by the place of recovery of automobiles stolen in Detroit. Of 390 automobiles recovered outside of Detroit, 54.9 per cent were found within the commutation area (metropolitan district). Only 10 automobiles or 2.5 per cent of the total

Comparison of Regions and Areas of Criminal Mobility as Indicated by: (1) Places Outside of Detroit in which Were Arrested a Sample Group of 500 Offenders with Criminal Records in Detroit; (2) Places for which Positive Identifications Were Made of Offenders with Criminal Records in Detroit; (3) Places to which Telegrams Were Sent by the Detroit Police Department; (4) Places to which Telephone Toll Calls Were Made by the Detroit Police Department; (5) Places Outside of Detroit in which Automobiles Stolen in Detroit Have Been Recovered; by Cumulative Per Cent of the Total for Each Series.

	(1)	(2)	(3)	(4)	(5)
	439	2038	1324	1406	390
Region or Area	Arrests	Letters	Tele-grams	Toll Calls	Stolen Cars
I—Detroit commutation area (metropolitan district)	6.3	2.6	0.0	59.4	54.9
II—Detroit metropolitan region	17.5	10.8	8.5	84.4	75.7
III—Outside of the region, within Michigan	18.1	11.5	9.6	87.0	78.5
IV—Detroit inter-state migratory area	81.7	85.6	76.3	99.1	97.5
V—Outside of the migratory area (total for the United States)	100.0	100.0	100.0	100.0	100.0

were recovered in the 36 states outside of the region of inter-state migrations.

The three other indexes likewise show a definitely regional pattern but one which is much more extensive territorially than that evidenced by toll calls and stolen automobiles. The striking fact is that these three indexes each indicate pretty much the same range of movement. The 2,038 offenders identified by letters dur-

ing the five year period are perhaps the most representative of these three indexes because of the larger number of offenders and the longer time period. Only 55 or 2.6 per cent of these offenders were identified for places within the commutation area (metropolitan district) and only 10.8 per cent within the metropolitan region. Nevertheless a marked tendency towards a regional pattern is evidenced by the fact that no more than 14.4 per cent of the identifications were made for places outside of the Detroit interstate migratory area.

The summarized data in the table show that the breaks are sufficiently large at the margins of the commutation area that this may be considered to be a region delineated upon the basis of criminal mobility. The validity of the metropolitan region as an area of criminal mobility is demonstrated by the relatively few contacts of any kind which were recorded between Detroit and places in Michigan outside of the metropolitan region. The number of these together with the percentages of the United States total for the respective series is as follows:

	Number	Per Cent
1. Arrests of 500 Detroit offenders.....	3	.6
2. Offenders identified by letters.....	14	.7
3. Telegrams sent to other places.....	15	1.1
4. Telephone toll calls made.....	36	2.6
5. Stolen automobiles recovered.....	11	2.8

Thus, included within the Detroit metropolitan region is almost all criminal mobility between Detroit and other places in Michigan. But since the metropolitan region is the only one of the three regional units which takes competing centers into account, in order to demarcate its boundaries upon the basis of criminal mobility, data would have to be obtained which describe the movement of criminals to and from Chicago as a center and Toledo as a center. This is the same as saying that the boundaries between the Detroit metropolitan region and the metropolitan regions of both Chicago and Toledo would have to be determined upon the basis of *criminal* mobility. This is not done because the somewhat more specific delineation does not seem warranted. The reasons for this inference are these. The two competing centers are taken into account in delineating the Detroit metropolitan region on the basis of automobile traffic. The five indexes to criminal movements supplement each other in demonstrating the general gradient character of criminal mobility. Also, the number of criminal movements between

Detroit and places in Michigan outside of the metropolitan region is significantly small. These evidences seem sufficient to warrant the view that the metropolitan region as delineated upon the basis of automobile traffic is essentially the same as the metropolitan crime region delineated upon the basis of criminal mobility.

Whether or not the region of inter-state migrations to Detroit may be considered to be likewise a region of criminal mobility requires more than a statement of the fact that most movements to and from Detroit are included within the area. This may be primarily because most of the population of the country is within this area and not as a result of any regional or distance factor. The Middle Atlantic and East North Central divisions had larger populations in 1930 than any of the other seven divisions.²¹ and these two, excepting New Jersey, are included within the Detroit region of inter-state migrations. But examination of the data will show that the size of population *operated as a conditioning factor* and did not remove the element of distance. Thus, New York and Pennsylvania each have larger populations than Ohio yet many more contacts were established between Detroit and places in Ohio. Also, a gradual decrease in the number of contacts goes from Ohio through Indiana, Kentucky, Tennessee, and Alabama, although the population of these states does not decrease in this order. On the other hand, more contacts were made between Illinois and Detroit than between Detroit and Indiana which is closer. The reason for this is undoubtedly the fact that the population of Illinois is over twice as large as the population of Indiana. The factor of distance, in this instance, was subordinated to size of population.

These five indexes to criminal mobility all substantiate the contention that criminal movements have a regional pattern. That the commutation area is the zone of most frequent inter-community movements, relative to its size and population, seems to follow from the indexes based upon telephone calls and stolen automobiles. It is the primary zone because it is necessarily involved in movement to more removed places. The coincidence between the metropolitan region and the range of criminal movements follows from the general gradient character of criminal mobility as indicated by the five measures coupled with the fact that very few movements were recorded to places in Michigan outside of the metropolitan region.

²¹ *Ibid.*, Vol. 1, p. 10.

Possible Errors of Interpretation

It is desirable at this point to examine as thoroughly and critically as we may the possibilities of error in the meanings which have been inferred from the data describing the areas of criminal mobility. This does not imply that the data themselves are not open to question; certainly they are, and their shortcomings as measures of mobility have been indicated. But assuming the facts to be accurate *as such*, and this seems to be a fair assumption, more than one interpretation of them is possible. The problem emphasized here is that opposing or other interpretations in considering these data may have been avoided. Do the measures of criminal mobility which have been presented lend themselves only to an affirmation of the regional hypothesis which was advanced in the first paragraphs of this study, namely that criminal phenomena, as an inter-related part of the general social life, have spatial regularity over areas that are larger than cities and are therefore regional?

An argument opposed to such an affirmation might contend that a selected group was the basis for all of the indexes to criminal mobility excepting that based upon stolen automobiles, that the mobility of *arrested offenders* is measured rather than the mobility of a chance selection of criminals. The argument continues that the more able criminal is not apprehended. His mobility may or may not conform to a regional pattern. The place of recovery of stolen automobiles is an inadequate index because this offense is usually committed by non-professional offenders. And therefore the regional hypothesis is left with the Scotch verdict of "not proved."

This same objection may be raised legitimately against almost any criminological investigation. The only alternative to the general procedure followed in this study is to observe the criminal "in the open." Difficulties and complications of such an approach to the problem are legion and it is also true that the results would be more complete if supplemented by data of the present type. None of the data of this chapter pertains to prisoners, all pertain to persons arrested. It is believed that the fundamental error advanced by the argument in the preceding paragraph is thereby minimized in view of the dictum by Sellin that "the value of a crime rate for index purposes decreases as the distance from the crime

itself in terms of procedure increases."²² Many, perhaps most, of the offenders upon which the indexes of the present study are based were released or acquitted; but their mobility is recorded.

A second criticism of an affirmative interpretation of the regional hypothesis follows from the fact that four of the five indexes are based upon police communications rather than the mobility of offenders, and that the police themselves may be assuming a regional hypothesis consciously or unconsciously. For example, if an offender is wanted in Detroit and he is suspected of being in Toledo or San Francisco the police would communicate with Toledo either because they would believe the chances greater that the offender would be there, or because it is cheaper and quicker to communicate with Toledo, or both. This objection would apply to the validity of the indexes to criminal mobility excepting that based upon stolen automobiles and this could be again rejected as inadequate.

Part of this criticism is pertinent and cannot be denied. It is undoubtedly true that if distant places could be communicated with as cheaply and quickly as near-by places, the indexes to criminal mobility might present a different picture. But it is equally true that the same factor, distance, which is a barrier to police communications is also a barrier to criminal movements. It is cheaper and quicker for a criminal or anyone else to go to Toledo from Detroit than to go to San Francisco. Nevertheless it remains unproved whether distance is more or less of a barrier to police communication than to criminal mobility. Moreover, police communications are based upon professional experience in policing, and on the basis of this experience the police believe that offenders with criminal records in Detroit are more likely to have records in proximate places than in remote places. This view rather than the contrary tends to be substantiated by the remaining index, the place of recovery of stolen cars, to which the criticism does not apply.

A third and perhaps final rejection of the regional hypothesis might follow from the fact that there are wide differences in the range of criminal movements shown by the different measures of mobility. The contention might be made that different indexes to the same thing should be more consistent with each other, and if the differences are as large as they are here, then the investi-

²² "The Basis of a Crime Index," *Jour. Crim. Law and Criminology*, Vol. 22, September, 1931, p. 346.

gator must have "different kinds of birds by the tail." If this is the case, then any interpretation of the indexes whatever is fallacious.

This criticism may be entirely refuted. Certainly telegraphic and telephonic communication would not be expected to involve the same distances. One measure supplements the other. The places of recovery of stolen automobiles indicate shorter distances than either the places of arrest of offenders with criminal records in Detroit or the places for which positive identifications were made in response to letter requests, the latter indexes involving different types of offenders. These facts are entirely in accord with the conclusion developed elsewhere,²³ namely, that criminal mobility varies with types of offenses and with types of offenders. That there are differences in the five indexes does not render them valueless. Rather, the differences render them more significant since they can be related to and interpreted consistently with other facts of criminal mobility. Criminal mobility is not conceived as simple and unitary, but rather as a complex and general process.

Conclusion

Criminals and non-criminals both utilize, of course, identical means of communication and transportation. Chief among these is the automobile which has altered the pattern of settlement distribution and the movement habits of our whole people. The general effect of the automobile upon settlement has been to break down the pre-automobile distribution of rural areas and urban areas and to substitute for this a gradient or regional pattern marked by gradually decreasing density of settlement with distance away from metropolitan centers. The general effect of the automobile upon mobility has been to bring about a functional integration of metropolitan centers with the areas which surround them. That the degree of this integration generally decreases gradually with distance from the center is shown by the volume and destination of movement. The mobility of population is greatest in frequency in the metropolitan centers and decreases more or less regularly as distance from the center increases. This gradient character of mobility with reference to the larger cities as centers is the basis for circumscribing regions of movement. Boundaries are drawn

²³ Federal Bureau of the Census, *Prisoners: 1923*, Washington, 1926, p. 92; and *The Prisoner's Antecedents*, Washington, 1929, pp. 54, 55.

at the breaks or points of lowest volume on the gradient where the trend in an opposite direction begins. Three regions of mobility centering about Detroit are delineated in this manner: The Detroit commutation area, having a radius of about 35 miles; the Detroit metropolitan region, extending from about 50 to 400 miles from the city; and the region of inter-state migrations to Detroit, consisting roughly of several states surrounding Michigan. The former two regions are characterized by temporary or routinized movements and the latter by more permanent, longer-range movements.

Applying these regional units to an analysis of the mobility of criminals, the most general conclusion evidenced from the data is that distance is a factor in the movements of criminals just as it is a factor in the movements of the general population. The volume of criminal mobility to and from a particular center varies inversely with distance from the center. The more frequent criminal movements are included within the commutation area and the metropolitan region. Those criminal movements which are outside of the metropolitan region are almost entirely included in the adjacent states within the region of inter-state migrations to the dominant center. The boundaries of the metropolitan region are not simple and unitary but rather are manifold, representing zones of diminishing influence. Likewise it appears that there is not one region of criminal mobility but several, the principal three types of which have been described. Thus the crime region is a reality as evidenced by the gradient character of criminal mobility.

DISTRIBUTION OF CRIMINAL OFFENSES IN METROPOLITAN REGIONS*

STUART LOTTIER¹

The regional trend in the United States is largely the result of two developments: the historical background of sectional differences in resources, industry, tradition; and the recent impact of motor transport which has changed people's movement habits, helped create large metropolitan cities, and brought settlement closer to the cities. These general processes have combined to obliterate political boundaries and bring about a regional regularity which is only now maturing as the territorial basis of modern American civilization. The hypothesis of the present study is that crime, as an interrelated part of the general social life, is also regional, and that the delineation of regions of crime would have both theoretical and practical utility. An earlier article² demonstrated that criminal mobility has a regional pattern, that criminal movements to and from a city tend to decrease regularly with distance from the city. The present article proposes to determine whether criminal offenses are distributed regularly in metropolitan regions. A future article will analyze the distribution of offenses in the larger territorial units called sectional regions.

A metropolitan region is here defined as an area dominated by a central city and its boundaries are delineated by the distribution of one or more variables which change gradually from center to boundary where the trend in an opposite direction begins. An essential criterion of a region is thus its gradient character. The variables to be observed in the present article are criminal offenses, spatially fixed events, not mobile offenders. Crime gradients on the basis of the distribution of *offenders* in city areas have been worked out in detail by Shaw and McKay for juvenile delinquents

* This is the second of three contributions by the same author on this general subject. The first appeared in number four of the preceding volume at page 657 ff.

Based on a doctoral dissertation, Department of Sociology, University of Michigan, June, 1936.

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² "Regions of Criminal Mobility: Introduction to a Detroit Study," this JOURNAL, preceding volume number four.

within numerous American cities.³ They conclude that there are wide variations between different neighborhoods and that delinquency rates are generally highest in the centers of cities and decrease with distance away from the centers; likewise rates are high near industrial and commercial subcenters within the cities and decrease with distance away from these subcenters. In Chicago, adult commitments to the county jail follow the same pattern.⁴ Other studies indicate that there is a gradient tendency in the distribution of offenses over areas that are larger than cities. Watts has shown that the per capita rate of convictions recorded for indictable offenses in Canada increases with population density.⁵ The presence of gradients follows from the fact that in metropolitan regions settlement is most dense in the dominant city center.⁶

Sutherland has established regional gradients for two offenses with Chicago as the center. He obtained burglary and robbery data from chain stores and banks. For 1931 and 1932 the proportion of stores which had been burglarized or robbed decreased steadily by 25 mile zones from 59.6 per cent in the city of Chicago to 29.8 per cent in the suburban area within 25 miles from the center of Chicago to 6.2 per cent in the zone 100-125 miles away from the city. "The banks in Chicago, East St. Louis, and Wichita are less frequently burglarized or robbed than banks outside those cities but within 25 miles of the center of the city, but the rate of burglaries and of robberies of banks decreases as distance from the city increases."⁷

The present article attempts to extend Sutherland's method of analysis to the distribution of eight offenses in the Detroit commutation area and the Detroit metropolitan region. The commutation area is roughly the city and its suburbs, the "built-up" area which often includes scores of political jurisdictions. It is almost

³ Clifford R. Shaw and Henry D. McKay, *Social Factors in Juvenile Delinquency*, Natl. Comm. on Law Observ. and Enforc., No. 13, Vol. 2, Washington, 1931, *passim*.

⁴ *Ibid.*, pp. 66 and 107.

⁵ "The Influence of Population Density on Crime," 26 *Jour. Am. Stat. Assoc.*, 1931, p. 18.

⁶ But it has not been shown that there is a complete positive correlation between criminal offense rates and the size of urban population aggregates. In the United States, *Uniform Crime Reports* (U. S. Department of Justice, Vol. 6, No. 4, Table 1) classifies the per capita rates of eight offenses by cities grouped according to size. In general, the larger cities have the higher rates for all offenses, but murder, burglary, larceny and auto-theft are highest in cities between 100,000 and 250,000 inhabitants and second or third highest in the group of larger cities. Apparently the crime dominance of cities is not entirely explainable in terms of demographic factors.

⁷ *Principles of Criminology*, Chicago, 1934, p. 122.

identical to the "metropolitan district" which is defined by the census to include "in addition to the central city or cities, all adjacent and contiguous civil divisions having a density of not less than 150 inhabitants per square mile."⁸ The metropolitan region is a larger unit, roughly the wholesale area or trucking area surrounding a city. McGill⁹ delineated the Detroit metropolitan region on the basis of motor traffic to and from Detroit, circulation of Detroit newspapers, telephone toll calls, and other tests.

Sources of Data

The most reliable index to the kind and volume of crime committed is the number of offenses known to the police. The English and several European countries have collected these data on a nation-wide basis since the middle of the nineteenth century and have consequently developed them into reliable indexes. Efforts in the United States until recently have proved fruitless.

"Since the organization of the International Association of Chiefs of Police in 1894, there has been scarcely an annual convention at which discussion of criminal records and statistics has not found a prominent place. In 1927, the movement took definite form when Police Commissioner William P. Rutledge of Detroit proposed that the Association designate a Committee on Uniform Crime Records."¹⁰

The result of this Committee was the publication in 1929 of *Uniform Crime Reporting*¹¹ which serves as a manual of recording practice for police officers. The collection and publication of this information was delegated in 1929 to the United States Department of Justice. The reporting by police agencies to the Department of Justice was and is entirely voluntary.¹² The data used here to determine the regional distribution of criminal offenses are obtained from the published and unpublished records of that Department.

The crimes selected for analysis are included among the Part I classes of the Uniform Classification. "Part I classes are restricted to those offenses which generally become known to the police, and

⁸ U. S. Census, 1930, *Metropolitan Districts*, pp. 5, 6.

⁹ K. H. McGill, *Methods for Delineating the Boundary and Integration Zones of Metropolitan Regions*, Ann Arbor, 1935, unpublished MS.

¹⁰ Committee on Uniform Crime Records, I. A. C. P., *Uniform Crime Reporting*, New York, 1929, pp. 1, 2.

¹¹ *Op. cit.*

¹² "Under our federal system, the national government cannot compel local governments to report on their operations. It can, however, assume responsibility for conducting a voluntary undertaking." *Ibid.*, p. 12.

which therefore serve as the best index to the amount of crime committed."¹³ These offenses are defined as follows:

"1. Criminal Homicide: The homicide group is confined to murder and manslaughter. It does not include justifiable homicide, such as a legal execution, and excusable homicide, as in self-defense.

"2. Rape: Rape is perhaps the only offense in Part I Classes which is not regularly reported to the police, but the aggravated nature of the offense is so great that it may properly be included as a separate class.

"3. Robbery: This class should be confined to the taking or attempted taking, of property from the person of another through the use of threat or force or by putting in fear. Pocket picking, purse snatching, and the like, where there is no use or threat of force, belong to Class 6.

"4. Aggravated Assault: In this class enter all assaults with intent to kill or assaults and attempted assaults by any means or weapon likely to cause death, all cases of maiming, and the like. Simple assaults appear in Class 8 below.

"5. Burglary—Breaking or Entering: This class is composed of all offenses known as burglary, breaking and entering and housebreaking, as well as attempts. Offenses which do not possess the characteristic of breaking or entering, such as possession of burglars' tools, should not be included.

"6. Larceny—Theft: In this class are included all cases involving the stealing and carrying away of personal property with intention to deprive the owner of the value or benefit thereof. Fraud, embezzlement, and obtaining by false pretense are listed separately as a Part II Class. In some of the tables of known offenses, Larceny—Theft is divided into two sub-classes according to the value of property taken: (a) \$50 and over in Value, and (b) Under \$50 in Value.

"7. Auto Theft: This class includes all cases where a motor vehicle is stolen or driven away and abandoned, and should not include taking for temporary use where actually returned, illegal use by chauffeurs, and the like. Cars recovered within twenty-four hours should not be deducted from the total of cars reported stolen."¹⁴

The Detroit Commutation Area

Table 1, below, summarizes the numbers of Part I offenses for 34 of the 43 incorporated places in the Detroit commutation area described as the metropolitan district for 1932, 1933, and 1934. This information is unavailable for the nine remaining places because several are so small that they are policed only by the county sheriff and have no independent force, or if they do employ police officers their records are incomplete or otherwise unacceptable for

¹³ Committee on Uniform Crime Records, I. A. C. P., *A Guide for Preparing Annual Police Records*, Revised, 1935, p. 11.

¹⁴ *Ibid.*, pp. 11, 12.

the present purposes. The 34 places for which the number of offenses are obtained represent 95.1 per cent of the total population of the district in 1930. The numbers of offenses occurring within the city of Detroit are recorded separately for the fifteen police precincts into which the city is divided. The metropolitan district is thus broken down into 48 areas for which the number of Part I Offenses are known for the three year period.¹⁵

The 48 areas are divided into seven zones according to distance from the Detroit city hall. The total of each offense occurring within each zone is divided by the population represented to determine the per capita rates. These data are plotted graphically in Figure 1. It is evident that five of the eight curves show definite gradient tendencies while the curves for larceny are only slightly gradient and burglary shows no gradient tendency whatever. Why do some offenses show the gradient distribution while others do not? This problem is reserved until the offense distribution within the metropolitan region is presented.

The Detroit Metropolitan Region

In order to determine whether or not there is a gradient pattern to the distribution of offenses in the Detroit metropolitan region, the numbers of Part 1 offenses are obtained for seventeen Michigan cities outside of the commutation area (metropolitan district) for 1932 and 1933. As is done for the commutation area, Table 2 tabulates these offenses in intervals according to distance from the Detroit city hall. The totals of each offense for each interval are divided by the population represented to get the rates per capita for each of the three groups of cities. Comparable rates are calculated for the total of 34 of the 43 incorporated places within the commutation area. These rates for the four unit aggregates are then plotted in zones by the average number of miles distant from Detroit. The results are shown graphically in Figure 2.¹⁶ It is evident that there is a definite gradient pattern in the distributions of four offenses: murder, rape, assault, and robbery. But there are only tendencies towards a gradient for burglary, auto theft, larceny, over \$50.00, and larceny under \$50.00.

¹⁵ Except rape which is calculated from 1934 data only.

¹⁶ The number of rape offenses reported by police in 33 incorporated places within the commutation area other than Detroit are excluded from the tabulation. The rape rate for the commutation area (metropolitan district) is based on Detroit offenses only.

TABLE 1—PART I OFFENSES KNOWN TO THE POLICE AND RATE PER 100,000 POPULATION FOR 44 POLICE JURISDICTIONS IN THE DETROIT METROPOLITAN DISTRICT TABULATED IN ZONES BY MILES DISTANCE FROM THE DETROIT CITY HALL, 1932 THROUGH 1934, INCLUSIVE*

Zone and distance†	Aggregate Population	Murder	Rape‡	Robbery	Assault	Burglary	Larceny Over \$50	Larceny Under \$50	Auto Theft
I—0 to 2.9 mi.									
Total	319,800	127	267	1945	1410	3509	1053	26134	5508
Rate		39.7	83.4	608.1	440.9	1097.2	330.8	8169.1	1722.3
II—3 to 5.9 mi.									
Total	920,700	96	309	2524	638	6586	1474	30825	7058
Rate		10.4	33.5	274.8	69.2	715.4	160.0	3347.9	766.5
III—6 to 8.9 mi.									
Total	410,800	31	129	802	275	3233	425	9647	1811
Rate		7.5	31.4	195.2	66.9	787.0	103.4	2350.7	440.8
IV—9 to 11.9 mi.									
Total	204,600	7	36	334	25	1384	148	3846	670
Rate		3.4	17.6	114.3	12.2	681.3	72.3	1390.6	327.4
V—12 to 14.9 mi.									
Total	41,900	0	6	26	4	327	70	684	100
Rate		0	14.3	62.0	9.5	780.4	167.0	1608.5	238.6
VI—15 to 19.9 mi.									
Total	20,200	0	0	18	1	126	26	451	38
Rate		0	0	89.1	4.9	623.2	128.7	2232.6	188.1
VII—20 to 24.9 mi.									
Total	86,200	10	15	121	65	1130	229	1782	425
Rate		11.6	17.4	140.0	75.4	1310.4	268.1	2067.2	446.7

* Unpublished offense data obtained from the Federal Bureau of Investigation, Department of Justice; population data from United States Census, 1930, *Metropolitan Districts*, p. 73, and Volume I, *Population*, Table 2, p. 512.

† The following jurisdictions are included: Zone I, Detroit precincts 1, 2, 3, 13, 8; Zone II, precincts 7, 9, 6, 5, 4, 10, Hamtramck, Highland Park; Zone III, precincts 11, 15, 12, River Rouge, Grosse Pointe Park, Ecorse, Melvindale, Grosse Pointe Village, Dearborn; Zone IV, precinct 14, Grosse Pointe Farms, Ferndale, Lincoln Park, Allen Park, Centerline, East Detroit, Wyandotte, Pleasant Ridge, Oak Park; Zone V, Roseville, Royal Oak, Berkely, St. Clair Shores; Zone VI, Clawson, Trenton, Birmingham, Wayne; Zone VII, Mount Clemens, Plymouth, Pontiac, Rochester.

‡ 1934 offenses multiplied by 3.

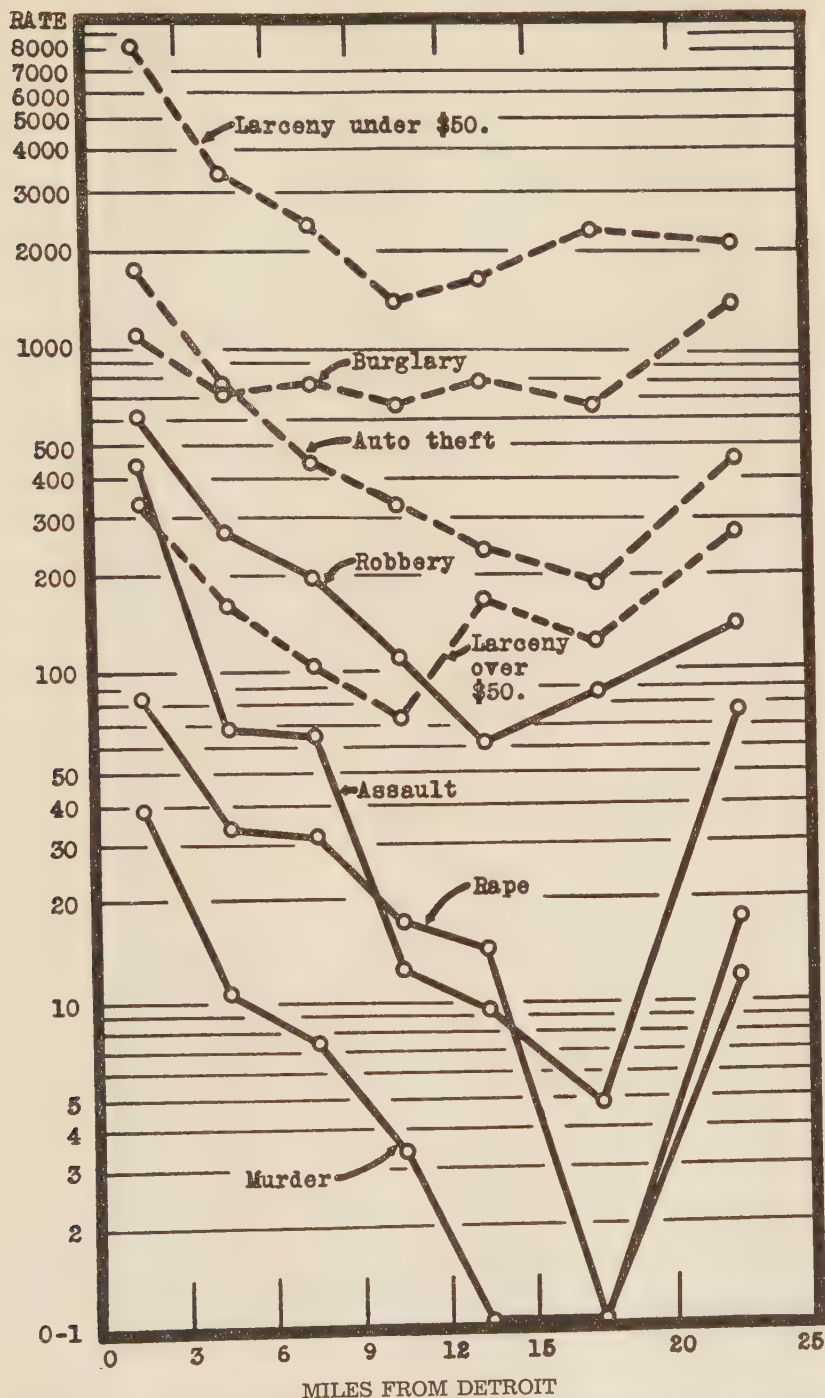


FIGURE 1. Rates per 100,000 Population of Eight Offenses Known to the Police for Detroit Police Precincts and Incorporated Places in the Detroit Metropolitan District, 1932-1934, Except Rape which is Calculated upon the Basis of 1934 Only, Plotted by Miles Distance from Detroit.

TABLE 2—PART I OFFENSES KNOWN TO THE POLICE AND RATE PER 100,000 POPULATION, FOR THE DETROIT METROPOLITAN DISTRICT AND SEVENTEEN MICHIGAN CITIES OF OVER 10,000 INHABITANTS TABULATED IN ZONES BY MILES HIGHWAY DISTANCE FROM DETROIT, 1932 AND 1933*

Zone and Average distance†	Aggregate Population	Murder	Rape	Robbery	Assault	Burglary	Larceny Over \$50	Larceny Under \$50	Auto Theft
1-10 Miles									
Total	2,009,687	200	483‡	4,325	1,537	11,134	2,392	51,207	10,918
Rate		9.9	30.7	215.3	76.5	554.3	119.0	2549.5	543.5
II-51 Miles									
Total	311,301	18	76	269	239	2,070	463	5,478	1,005
Rate		5.8	24.4	86.4	76.7	664.9	148.7	1759.7	322.8
III-110 Miles									
Total	487,914	24	66	383	142	3,681	592	10,372	2,591
Rate		4.9	13.5	78.4	29.0	754.3	121.3	2125.4	530.8
IV-199 Miles									
Total	95,035	3	12	48	19	390	46	590	254
Rate		3.1	12.6	50.5	20.0	410.5	48.4	631.0	267.3

* Unpublished offense data obtained from the Federal Bureau of Investigation, Department of Justice; population data from United States Census, 1930, *Metropolitan Districts*, p. 73, and Volume I, *Population*, Table 2, p. 512.

† The following places are included: Zone I, 33 incorporated places within the Detroit Metropolitan District representing 95.4 per cent of the population; Zone II, Monroe, Ypsilanti, Ann Arbor, Port Huron, Flint, Adrian, Jackson; Zone III, Lansing, Owosso, Saginaw, Bay City, Battle Creek, Kalamazoo, Grand Rapids; Zone IV, Holland, Niles, Benton Harbor, Muskegon, Traverse City.

‡ Detroit only.

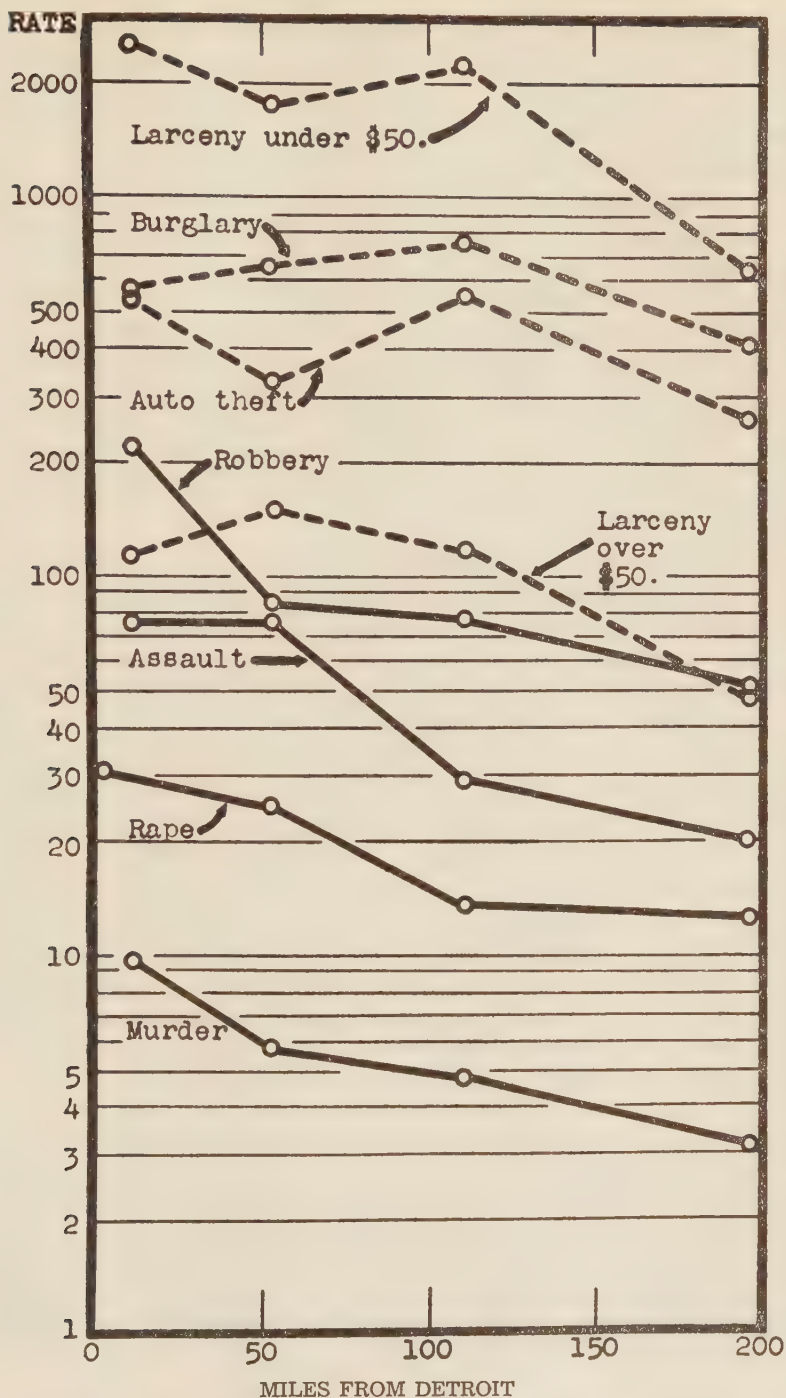


FIGURE 2. Rate per 100,000 Population of Eight Offenses Known to the Police, for the Detroit Metropolitan District and Seventeen Michigan Cities of Over 10,000 Inhabitants, 1932 and 1933, Plotted in Zones by Miles Highway Distance from Detroit.

The rates of both burglary and larceny over \$50.00 rise between the commutation area and the second zone, burglary continuing to rise until the third zone. Larceny under \$50.00 and auto theft decrease between the commutation area and the second zone but both rates rise between the second and third zones.

Assuming that there may be a gradient for these latter four offenses but that the technique employed does not make it apparent, then some factor may be common to them which is not present in any of the four offenses showing gradient patterns. It is apparent that each of the gradient offenses involves persons, whereas the non-gradient offenses involve property: houses, stores, factories to be burglarized, automobiles to be stolen, and all other kinds of property against which the offense of larceny might be committed. The items of property are probably variables which would have to be taken into account in making the rates for these offenses comparable for different places.

The feasibility of calculating larceny rates on a comparable basis is eliminated at once inasmuch as the types of property represented are too complex to be enumerated. Auto theft rates could be calculated on the basis of the number of automobile registrations, but registrations are available only for counties and are not tabulated for cities and other incorporated places. Burglary rates might be calculated on the basis of the numbers of dwellings which are recorded by the census. But the census definition of dwellings includes both single family and multiple family dwellings¹⁷ and proportions of these undoubtedly vary between the cities in the metropolitan region. Furthermore, the number of stores and other buildings is not recorded by the census and if burglary rates were calculated upon the basis of the number of dwellings, the assumption would have to be made that these were related in a constant proportion to the number of places which might be burglarized, because burglaries of business places and residence places are not distinguished in the reports of offenses known to the police.

The Gradient of Chain Store Burglaries

To determine if there is a gradient pattern in the distribution of

¹⁷ "A dwelling, for census purposes, is a place in which one or more persons regularly sleep. It need not be a house in the usual sense of the word. A boat, a tent, or a room in a factory or office building, although occupied by only one person, is also counted as a dwelling; while, on the other hand, an entire apartment house, although containing many families, constitutes but one dwelling." U. S. Census, 1930, Vol. 6, *Families*, p. 10.

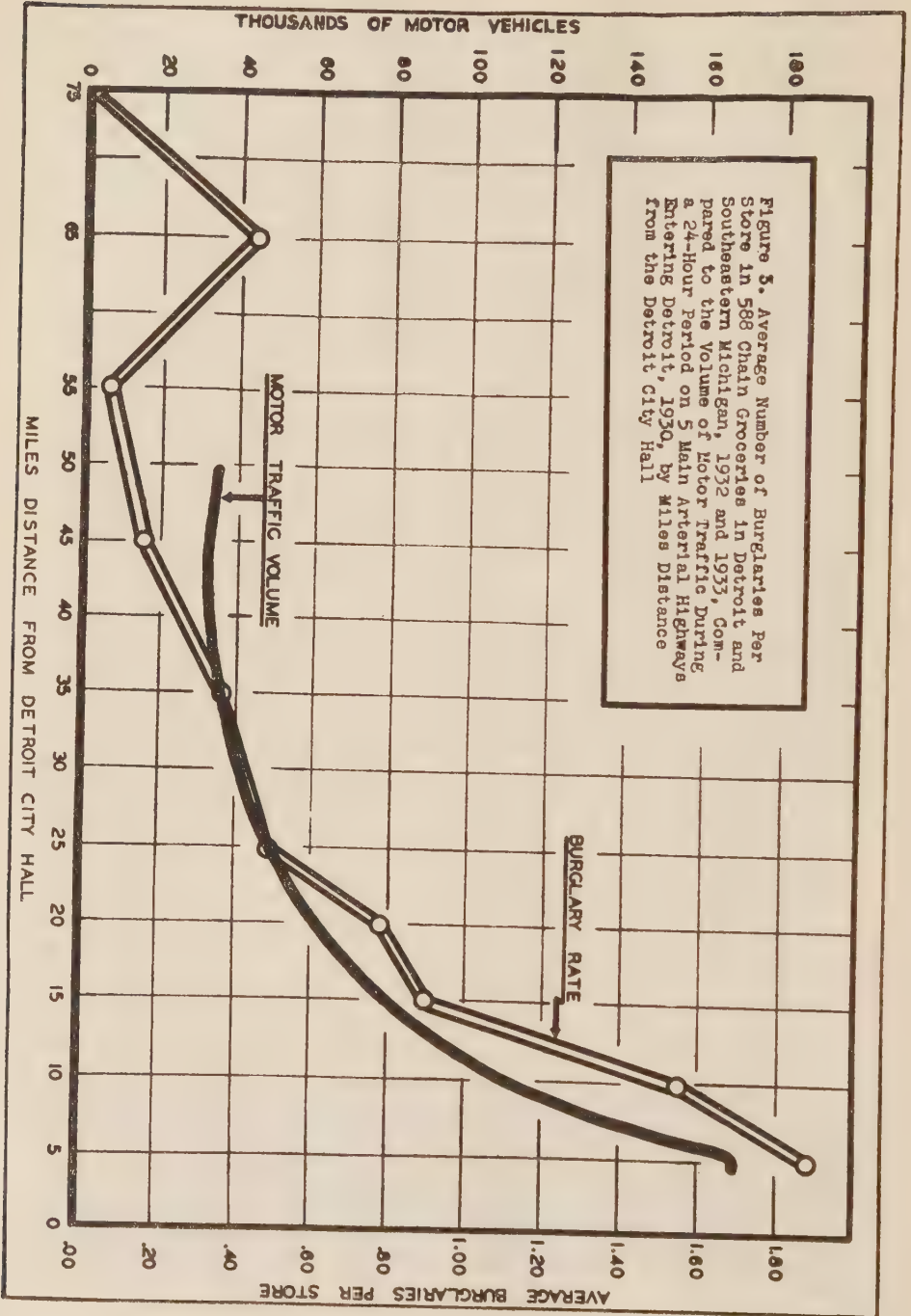
burglaries, and also as a general check upon the validity of gradients based upon offenses reported by the police, records of store burglaries were obtained from a large chain of retail groceries. This chain operates approximately 600 stores in Detroit and southeastern Michigan. The locations of the stores are spotted on a map and also the number of times each had been burglarized during 1932 and 1933. Circles are drawn upon the map at five mile intervals centering about the Detroit city hall. The number of burglaries between successive circles are totalled and divided by the number of stores in the respective zones to get the average number of burglaries per store per zone. These data appear in Table 3. A gradient for burglaries is constructed by plotting the average number of burglaries by miles distance from the Detroit city hall. The result appears in Figure 3.¹⁸ This figure represents an "ideal" gradient, showing that burglaries of chain grocery stores are most frequent in the center of the city, lower in the thinly populated areas, and higher in the satellite cities between the 55 and 75-mile circles. The burglary gradient is superimposed upon Waldon's gradient of traffic volume¹⁹ to which it is remarkably similar.

TABLE 3—AVERAGE NUMBER OF BURGLARIES IN 588 CHAIN GROCERY STORES IN DETROIT AND SOUTHEASTERN MICHIGAN, BY 5-MILE INTERVALS FROM THE DETROIT CITY HALL, JANUARY 1ST, 1932 TO DECEMBER 31ST, 1933

Distance From Detroit (Miles)	Number of Stores	Number of Burglaries	Average Burglaries Per Store
0 - 5	281	524	1.87
5 - 10	161	249	1.55
10 - 15	31	28	.90
15 - 20	9	7	.77
20 - 25	27	13	.48
25 - 35	11	4	.36
35 - 45	20	3	.15
45 - 55	14	1	.07
55 - 65	32	14	.44
65 - 75	2	0	.00
Total	588	843	1.43

¹⁸ Robbery data were obtained from the same grocery stores, and also both burglary and robbery data from the records of a chain of drug stores and a chain of gasoline filling stations. But in all three of these series the numbers of offenses were too few to establish continuous gradients. The data in Table 1 are tabulated by 10-mile intervals between the 35 and 75-mile circles because of the relatively few stores and burglaries beyond the 35-mile circle.

¹⁹ *Metropolitan Highways*, Address before the American Association of State Highway Officials at their Sixteenth Annual Convention, Pittsburgh, 1930, p. 11. Reproduced in R. D. McKenzie, *The Metropolitan Community*, New York, 1933, p. 87.



It is apparent from this that some such variable as the number and kind of dwellings is operating in the per capita distribution of burglaries both in the commutation area and in the metropolitan region. The per capita series both show constant rises, whereas the burglary-per-store series shows a gradient decline, as noted. Coupling this with the decrease in the per capita distribution of burglaries between the 110 and 199-mile zones, it seems safe to construe that the distribution of burglaries in the metropolitan region tends towards a gradient pattern.

Conclusion

The gradient is an essential and quantitative criterion to determine whether a distribution is regional. Four offenses have a gradient distribution within both the commutation area and the metropolitan region. These offenses are murder, aggravated assault, rape, and robbery. The offenses not distributed according to a gradient are those involving units of property which act as variables in per capita series. These offenses are burglary, larceny, and auto theft, although the latter offense together with larceny-under-\$50.00 offenses both tend towards a regional pattern. Burglaries show a gradient throughout the commutation area and into the metropolitan region when calculated upon the basis of store burglaries per store rather than total burglaries per capita. From this fact it is inferred that a gradient would be characteristic also of the distributions of larceny and auto thefts if comparable rates could be calculated for these offenses. Thus, not only does criminal mobility have a regional pattern, as demonstrated in the article cited above, but a gradient regularity also characterizes the distribution of Part I offenses in both the commutation area (metropolitan district) and the metropolitan region.²⁰ The crime region is thus an objective reality.

It is important to relate this conclusion to the fact well estab-

²⁰ No attempt is made to demonstrate any antecedent-consequent relation between these two kinds of facts. They are both regarded as related to the problem of regional crime. It is recognized that if two classes of data present similar gradient patterns it does not necessarily follow that they are etiologically related. Nevertheless, if a crime region may be delineated upon the basis of both then the degree to which the two delineations coincide is a measure of the degree to which the crime region is an objective reality. The general assumption in constructing such gradients is that both the mobile and the spatially fixed aspects of criminal phenomena are related to the conditioning factors which are concentrated in the given center and decrease with distance away from the center. The analysis of these conditioning factors is, of course, a separate undertaking.

lished elsewhere that the large predominance of criminal offenses are committed in response to economic or sustenance conditions. This means that the criminal is not to be regarded as isolated from the division of labor of the general community but rather as one who participates in the same general culture and makes a living in the general economy as does the non-criminal. Both utilize the same means of transportation and communication; both are drawn to the city for its specialized and various occupational and recreational services; both exploit the city's resources and the resources of the smaller places centering about the city.

Metropolitan centers are the headquarters from which economic and commercial organizations integrate the surrounding region and likewise they are the headquarters for criminals. Not that criminal groups approximate the autonomous organizations of business. They are much more modest in their proportions. It is rather that the metropolitan center affords equal advantages to both alike: technical information, the latest news, markets for services and wares, lawyers, physicians, theaters, cabarets, a centralization of railroads, motor-buses, steamship lines, air routes, highways. Particularly to the criminal's advantage, the metropolis affords anonymity.

Having no intended reference to crime or criminals but more suggestive of these than the above remarks is Gras' metaphorical description of the metropolitan community:

"I can think of no better analogy than the web of the common spider. This efficient builder establishes first his radial lines running out in all directions from the center. Then the concentric fasteners are put in. At last the spider, posted at the center, is ready to do business. He is about equally distant from all parts. He can go in any direction. For the amount of silk spun he gets the largest possible income."²¹

The metropolitan region is a construction of the economic division of labor adjusted to motor transportation. It is "the most effective utilization of resources, human and material, yet known to society."²² And no less than the rest of the population, the criminal is automatically incorporated into the metropolitan economy.

²¹ "The Metropolitan Community," in E. W. Burgess, Ed., *The Urban Community*, Chicago, 1926, pp. 183-191.

²² *Ibid.*

DISTRIBUTION OF CRIMINAL OFFENSES IN SECTIONAL REGIONS

STUART LOTTIER¹

Two earlier articles in this *Journal* demonstrate that crime and criminals are not distributed over the country helter-skelter but occur in a regional pattern concentrating about metropolitan cities. This *crime region* is identical with the metropolitan region, a new unit of population settlement and mobility which has succeeded the town-and-country distribution characteristic of the pre-automobile era. A farmer living thirty or forty miles from Detroit, for example, markets his products in Detroit, and the prices he gets depend upon employment conditions in Detroit. He and his family read Detroit newspapers, attend Detroit theaters, listen to radio broadcasts from Detroit, patronize Detroit department stores. If their Ford is stolen, the local Sheriff calls the Detroit police. And when a major robbery occurs in Detroit, State police and local officers in the surrounding country cooperate in blockading the highways leading out of the city. The metropolitan region functions as a crime region, despite the fact that it has no political existence, nor does any formal agreement exist between the scores of police jurisdictions contained within its boundaries.

Geographic, economic, and cultural processes had combined to develop patterns of settlement in the United States a century or two before *metropolitan* regions appeared on the scene. These recent territorial units are the product of automobiles and large cities but are themselves parts of larger, longer established *sectional* regions. Thus, gradients have been used to delineate the crime region of a large city, and to show the large city's crime dominance over outlying zones. This dominance is a result of concentration in metropolitan centers of economic and commercial functions. But while the metropolitan regions of Boston and Atlanta, for example, may show crime rates which decrease regularly from their respective city centers, yet the extent and kind of crime committed in the two regions is very different. Each city has crime dominance over its region, but not explainable in terms of commercial and economic

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dominance are differences between crime in Boston and crime in Atlanta. The cultural background of the two cities is different. It is culture which distinguishes sectional regions.

The Concept of Culture

Culture is the basis for the attempted delineation of sectional regions and the concept of culture is fundamental to the ensuing paragraphs. Culture refers roughly to the social inheritance or the historical background which a group of people have in common. It is defined as "all those artificial objects, institutions, modes of life or of thought which are not peculiarly individual but which characterize a group and have both spatial and temporal contiguity."² Thus there are culture areas and cultural epochs. Sumner divided culture into folkways and *mores*: the first are customs which are morally indifferent while the *mores* are actively and rigidly enforced by the group.³ The *mores* may or may not be logical or rational, but the "*mores* can make anything right and prevent the condemnation of anything."⁴ Territorially, the *mores* vary from the narrowest limitations, like the locally circumscribed attitude of accepting the negro in social as well as political activities, to attitudes like *laissez faire* which are common in every section of the nation.

In general, this study has to do with the spatial regularity of the *mores*, and specifically with those *mores* that are indexed by the rates of selected offenses known to the police.

Historical Basis of Sectional Differences

The development of differences between sections in the United States involves the whole gamut of factors in the country's economic and cultural development. Two general types of factors are basic to this process: (1) the changing modes of transportation and communication, and (2) the different agricultural and industrial adjustments which were made in accordance with resources both natural and human. McKenzie distinguished three periods in the development of settlement in the United States: first, an adjustment of settlement to transportation by water, then by rail, and finally by motor vehicle.⁵ During the first era, "the various areas

² W. D. Wallis, "The Analysis of Culture," *Pub. Amn. Soc. Society*, Vol. 21, 1927, p. 158.

³ *Folkways*, Boston, 1907, *passim*.

⁴ *Ibid.*, title to chapter 15, p. 521.

⁵ *The Metropolitan Community*, *op. cit.*, pp. 3-7.

of habitation were, for the most part, self-contained and self-sufficient. Accordingly a condition of local life developed in this period which may be described as *sectionalism*.⁶ With the advent of rail transportation began tendencies towards the national integration of sections. Motor transport is integrating the sections still further, not on a national basis by reducing sectional differences, but on an intra-sectional basis by bringing the hinterland closer to the dominant cities. Thus Willey and Rice conclude that "longer journeys by more people are now made with relatively greater frequency than ever before. But *an even greater intensification of mobility takes place within circumscribed local areas*. While the average user of the automobile travels on occasion to distant points (with resulting new experiences and contacts) his travel within the narrower limits of the local area increases even more. *Contacts within the community area are multiplied out of proportion to contacts at a distance*."⁷

Present-day mobility is in no sense obliterating sectional differences, as is commonly supposed. What seems to be happening is an integration of the old section in terms of the newly expanded cities and their respective hinterlands. Boundaries between sections would not be arbitrary state lines but zones of diminishing influence between the regions of each respective section. Thus defined, the section assumes an orderly gradient character, becomes a *sectional region*. It is the result of the impact of economic and historical processes upon modern transportation, particularly the automobile.

Many of the cultural variations between sectional regions are deeply rooted in the types of settlement which accompany different economies. The south, predominantly agrarian, was sparsely settled according to a plantation economy. The north was quickly industrializing and its population began to concentrate in rapidly growing cities. While these patterns were becoming solidly established in the eastern half of the country, settlement in the western half was only being initiated in the pioneer or frontier stage.

From the plantation economy of the south sprang a tradition of sharp caste discrimination between the landed gentry and the negroes or poor whites whom they exploited. Castes engendered characteristic criminal offenses. One expression of the maintenance of rigid social stratification is lynching which has been confined to

⁶ *Ibid.*, p. 143.

⁷ *Communication Agencies and Social Life*, Recent Social Trends Monograph, New York, 1933, p. 57.

the southern and southwestern states.⁸ Also, family feuds developed in the isolated and thinly settled areas of the southern mountains "where self help was once the dominating necessity and where decentralized judicial administration has enfeebled the enforcement of the law."⁹ It is true that lynching and feuds are hardly significant numerically but they symbolize extremes of conditions which are territorially circumscribed.

In the north, taking root in the novel and uniquely rapid expansion of industry and the wholesale and private commandeering of natural resources, were tendencies to dissolve social precedent as a means of social control and to replace it with a peculiar fusion of corrupt politics and puritanical legislation. Organized racketeering and the gangster type have been characteristic of the urban north. Thus, many cities in the south and west have their traditional red light district, but limited to the north is the highly *organized* response to the urban demand for prostitution. In no small measure is organized crime in the north related to emulation of the men and methods of large-scale business and to the readily available and approved rationalization of the same dominant class.

In the west, as a counterpart of immature settlement, flourished the frontier tradition of intense individualism and the readiness of the westerner to take the matter of control into his own hands. The west was free, its land and its people, and it was unsettled culturally as well as it was unsettled territorially. Laws were few, and the vigilantes utilized the same violence in enforcing them as the outlawed desperadoes who broke them.

Differences in crime follow directly from historical differences in settlement and division of labor. Crime of a sectional nature continues in the cattle country of the west, but thoroughly conditioned by modern devices and techniques. "Instead of working over (cattle) brands, rustlers load cattle into trucks, transport them to a deserted area and slaughter them for meat, but officers can usually track the rustlers down. Range law requires that hides of slaughtered cattle be spread on a fence so that all comers may observe the brand. Instead, rustlers bury the hides. Deputies go straight to a cattle thieves' rendezvous by watching the buzzards and tracing truck-tire tracks."¹⁰

⁸ *The World Almanac and Book of Facts for 1936*, New York, 1936, p. 270; compiled by the Department of Records and Research, Tuskegee Institute.

⁹ Harold D. Lasswell, "Feuds," *Ency. Soc. Sci.*, Vol. 6, New York, 1931, pp. 220-221.

¹⁰ "Where the West Is Still Wild," *Popular Mechanics Mag.*, Nov., 1933, pp. 690-693.

There is today a noticeable contrast between tranquil New England and the comparatively furious west. It is highly improbable that a criminal of Dillinger's type could carry on his depredations in Massachusetts. A United Press dispatch of December 12, 1935, from Marblehead, Massachusetts, reported that "this 300-year old seacoast town has had its first holdup. . . . A salesman was held up at gun point and robbed of \$15." Is there a town in the whole west that has had no holdup?

Another illustration from another section: "The east has its tramp and the middle west its hobo with whom years of experience have enabled them to deal, but Oregon has a new problem which it does not yet know how to handle—the problem of the 'gasoline bum' . . . Oregon is suffering from the fact that its agricultural employers depend on an annual invasion of families in automobiles applying at their gates for work in harvesting the berries, cherries, vegetables, hops, prunes, and apples . . . Delinquency among migratory families is assuming such proportion as to require attention from the courts."¹¹

Do the statistics of crime show significant sectional differences? If so, are such differences sufficiently regular and orderly to be called regional?

Sources of Data

The police departments of approximately 1,350 cities regularly report the number of Part I¹² offenses which occur within their jurisdictions to the Federal Bureau of Investigation. These are tabulated by states, divided by the population represented in the respective cities of each state, and the resulting per capita rates are published in the quarterly *Uniform Crime Reports*. Compiled from this source for the present investigation are the totals of the rates for each offense for 1934 and 1935. In order to express all offenses on a comparable scale, the averages are determined for each offense and the rates expressed as the per cent of the average.¹³ The actual numbers of offenses per capita are not shown; the per-cent-of-average rates are in Table I.

¹¹ Louise F. Shields, "Problem of the Automobile Floater," *Monthly Labor Review*, Vol. 21, October, 1925, pp. 13-15.

¹² For definition of Part I offenses see *A Guide for Preparing Annual Police Records*, Committee on Uniform Crime Records, I. A. C. P., p. 11, or this *Journal*, May-June, 1938, p. 40.

¹³ The per-cent-of-average rates are not *strictly* accurate. They are calculated by dividing each rate by the average of the individual rates rather than by the true average rate. Because they are accurate *in seriatim*, however, the discrepancy in no way influences the coefficients of correlation which follow.

TABLE I

SELECTED OFFENSES KNOWN TO THE POLICE FOR URBAN PLACES REPORTING TO THE FEDERAL BUREAU OF INVESTIGATION, 1934 AND 1935, PER 100,000 INHABITANTS IN 1930 EXCEPT AUTO THEFTS WHICH ARE PER 10,000 AUTOMOBILES IN 1933, EXPRESSED AS PER CENT OF THE AVERAGE RATE*

State	Murder	Robbery (Holdup)	Aggravated and Assault	Burglary (Breaking Entering)	Larceny (Theft)	Auto Theft
Average	100	100	100	100	100	100
Maine	2	17	50	70	46	77
New Hampshire	12	8	9	42	30	21
Vermont	5	12	10	19	16	18
Massachusetts	18	39	25	71	51	94
Rhode Island	12	9	28	60	69	28
Connecticut	15	29	32	84	67	84
New York	46	23	51	23	47	60
New Jersey	45	63	82	93	52	66
Pennsylvania	46	61	50	41	24	61
Ohio	79	134	71	91	98	67
Indiana	68	131	74	93	101	91
Illinois	73	380	72	125	55	86
Michigan	34	72	67	60	105	60
Wisconsin	11	16	13	37	68	37
Minnesota	27	115	18	97	49	98
Iowa	30	82	15	87	94	64
Missouri	91	119	59	78	113	86
North Dakota	21	120	10	89	70	57
South Dakota	44	96	16	65	66	62
Nebraska	69	73	27	53	69	101
Kansas	73	136	43	119	131	47
Delaware	100	38	85	68	72	73
Maryland	58	71	15	62	51	101
Virginia	206	110	418	133	158	132
West Virginia	94	64	51	78	68	104
North Carolina	265	99	828	118	86	165
South Carolina	225	73	190	77	220	105
Georgia	229	57	152	97	155	118
Florida	223	130	230	176	157	111
Kentucky	185	219	300	172	130	183
Tennessee	323	222	356	121	42	182
Alabama	364	105	180	148	51	243
Mississippi	202	63	211	71	54	52
Arkansas	269	172	142	136	111	208
Louisiana	174	68	138	60	57	119
Oklahoma	106	149	72	155	133	84
Texas	189	109	158	138	160	156
Montana	66	57	19	67	159	47
Idaho	56	80	40	79	129	78
Wyoming	52	55	21	82	162	87
Colorado	67	189	33	178	126	83
New Mexico	98	88	20	121	162	98
Arizona	162	216	103	161	170	283
Utah	30	109	43	134	117	146
Nevada	120	115	20	176	229	198
Washington	39	132	50	184	139	111
Oregon	30	179	26	193	165	83
California	46	87	48	119	114	83

* Federal Bureau of Investigation, United States Department of Justice, *Uniform Crime Reports*, Vol. V, No. 4, Table 5, p. 10, and Vol. VI, No. 4, Table 5, p. 13; automobile registrations from National Automobile Chamber of Commerce, *Facts and Figures of the Automobile Industry*, New York, 1934 Edition; population data from U. S. Census, 1930.

There are several general sources of error in these data. (1) Entirely comparable rates by states can hardly be expected for the very reason that uniform crime reporting has been organized on a national basis for only a few years. (2) The per capita rates for 1934 and 1935 are calculated from the population enumeration of 1930 and the extent is unknown to which the numbers of inhabitants in the different cities had increased or decreased during the intervening time. (3) The state rates are based entirely upon the offenses reported in urban places and no allowance is made for differences in rural urban ratios. (4) Some states are represented by as many as 137 cities (Pennsylvania in 1935) while other states are represented by only a few cities. The ten states whose rates are calculated from five or less cities for either 1934 or 1935 are as follows:¹⁴

	<i>Cities Reporting</i>	
	1934	1935
Delaware	2	1
Maryland	4	6
South Carolina	2	3
Alabama	5	7
Arkansas	5	7
Idaho	5	6
Wyoming	5	4
New Mexico	3	4
Arizona	5	6
Nevada	3	4

The indexes of offenses for the aforementioned states are based on such few cities largely because the states are not densely populated and not because of unwillingness on the part of the police to report.

These general errors are apparently the causes of some inconsistencies in the tabulation by states. For example Wisconsin and Michigan had the two highest rates in the country for the offense of rape, while Ohio, Illinois, and Minnesota were considerably below the average rate for this offense. Again, Illinois had a robbery rate which was over five times as high as that of Michigan, and over 23 times as high as the rate for this offense in Wisconsin. It is doubtless true that these differences reflect in part variations in recording practices and are not to be interpreted entirely as actual differences in the per capita numbers of offenses committed in the respective states. A less general analysis of inconsistencies, by correlation, follows below.

¹⁴ *Op. cit.*, Vol. 5, No. 4, Table 4, p. 9; Vol. 6, No. 4, Table 4, p. 12.

Inter-correlations Between Offenses

Coefficients of correlation are calculated in order to get a mathematical statement of the consistency of variation between offenses. The coefficients are used here for three purposes: (1) as a partial indication of the reliability of the rates; (2) as a means of determining the extent to which the rates of one offense are associated with the rates of other offenses; (3) to determine whether the offenses tend to group together into classes. The coefficients of correlation are computed from the per-cent-of-average rates in Table I and are presented in Table II.

TABLE II
INTERCORRELATIONS BY STATES BETWEEN OFFENSES KNOWN TO THE POLICE FOR URBAN
PLACES REPORTING TO THE FEDERAL BUREAU OF INVESTIGATION,
TOTALS OF RATES FOR 1934 AND 1935*

	<i>Rape</i>	<i>Robbery</i>	<i>Assault</i>	<i>Burglary</i>	<i>Larceny</i>	<i>Auto Theft</i>
Murder	-.06	.32	.70	.39	.24	.17
Rape	..	.008	.03	-.04	.18	.28
Robbery (holdup)	..	..	.19	.67	.24	.42
Assault	..	..	..	.25	.08	.04
Burglary (breaking and entering)	..	..	..	..	.59	.61
Larceny	..	..	..	..	..	.48

* Calculated by the product moment formula from data in Table I. Auto theft rate is per 1,000 automobile registrations.

Regarding the reliability of the rates, it is apparent from Table II that the offense of rape tends to vary in a chance way and does not correlate above .28 with the other six offenses. This in itself is not proof that rate is reported inaccurately. There are two alternative interpretations: that rape is an independent variable or that it is the only one of the seven offenses which is reported accurately. The first alternative cannot be demonstrated on the basis of any facts in the present study. The second alternative may be rejected because field investigation of the reporting of offenses by places within the Detroit commutation area disclose that rape is recorded with a minimum of uniformity. This fact coupled with the consistently low correlation by states seemed sufficient to eliminate this offense from further consideration.

It has been contended that crime is a general tendency, and knowing the extent of one offense allows for estimating the extent of the others. This is the notion expressed by Brearley concerning the relationship between homicide and other offenses: "Not only

is homicide the one offense of importance for which reliable data can be secured, it is also the crime typical of many others . . .”¹⁵ A reverse statement of the relationship is made by another writer who contends that a high homicide rate is an indication of low rates for other offenses. Opposed to both of these views is Sutherland’s: “no judgment regarding other crimes . . . should be based on homicides, for homicides are in a class by themselves.”¹⁶

The data in Table II show that all of the coefficients (excepting rape) are positive and hence show a general tendency towards consistency. On the other hand, the size of the correlation is notably small. Only five of the 21 coefficients are approximately .50 or larger:

1. Murder and assault	.70
2. Robbery and burglary.....	.67
3. Burglary and auto theft.....	.61
4. Burglary and larceny.....	.59
5. Auto theft and larceny.....	.48

The size of these is large enough to consider the variables spatially related but not large enough to allow for estimating one from the other.

The relative configuration of the coefficients rather than their absolute magnitude is the basis for grouping the offenses into classes. It is apparent from the perusal of each column in Table II that offenses which may serve an economic or sustenance function group together. The largest correlations of robbery are with burglary, auto theft, and larceny. The largest correlations of larceny are with burglary and auto theft. Likewise, the non-sustenance offenses or crimes against the person group together. The largest correlation of murder is with assault which is considerably larger than the correlation between murder and burglary, the next highest. A third definite grouping is notable from Table II. It is that the higher correlations are between offenses which involve persons (murder, assault, robbery) as compared with correlations between offenses which involve units other than persons (burglary, auto theft, larceny).

Distribution of Offenses by States

The correlations show that there are three representative offenses: murder, robbery, and larceny. Maps are drawn for these

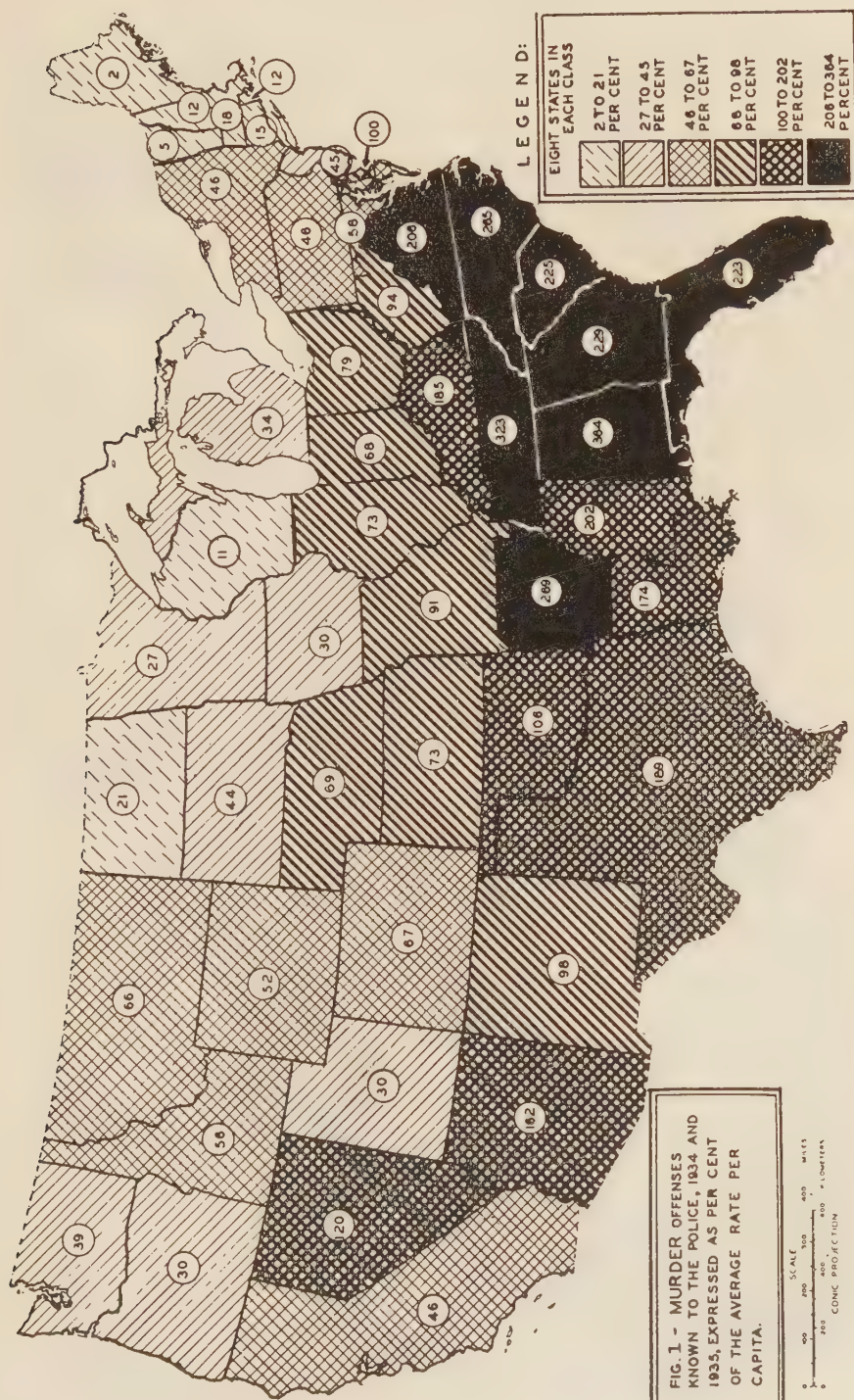
¹⁵ *Homicide in the United States*, Chapel Hill, 1932, p. 4.
¹⁶ *Principles of Criminology*, Chicago, 1934, p. 23.

to determine whether they are distributed according to a regional pattern. By regional here is meant something more than sectional, not only whether states of similar rates are lumped together but whether gradients characterize the distributions. Is there a gradual and orderly increase in specific rates from states having low rates to states having high rates?

The maps are constructed from the per-cent-of-average rates presented in Table I. They are all per capita rates. The states are arranged in rank order for each offense and divided into six groups of eight states each. Each state is cross-hatched from black to light gray according to its rank interval. Also each state is marked with the per-cent-of-average rate from Table I.¹⁷ Although the shading technique presents the distributions more graphically, the inserted rates give the more accurate distribution and are used in the following analysis of the distributions.

The distribution of murder offenses by states in Figure 1 shows a definitely gradient pattern. All of the eight states in class six on the map are adjacent states in the south east. Similarly lumped together are four adjacent states in the mountains which are in class three; seven adjacent central states in class four; three adjacent middle-Atlantic states in class three; five adjacent north-central states in classes one and two; and all six New England states in class one. It is notable that there is not one state which is more than one class removed from some adjacent state. Also, there are no class one states south of Wisconsin and no class six states north of Virginia. Neither are there any class one states adjacent to class six states. Referring to the more precise state differences as shown by the per-cent-of-average figures in the circles of each state, there are several lines or tiers of contiguous states which show regularly increasing murder rates. Some of these are as follows. (1) Going from north to south through six states from North Dakota to Texas; through five states from New York to North Carolina. (2) Going from south to north through three states from Florida to Tennessee, through three states from Texas to Tennessee. (3) Going from west to east through six states from Utah to Virginia; through five states from Colorado to Virginia; through five states from New Mexico to Alabama. (4) Going southeast through five states from Indiana to Texas. It is apparent from Figure 1 that the south-eastern section of the country is the dominant homicide area.

¹⁷ See note 13, above.



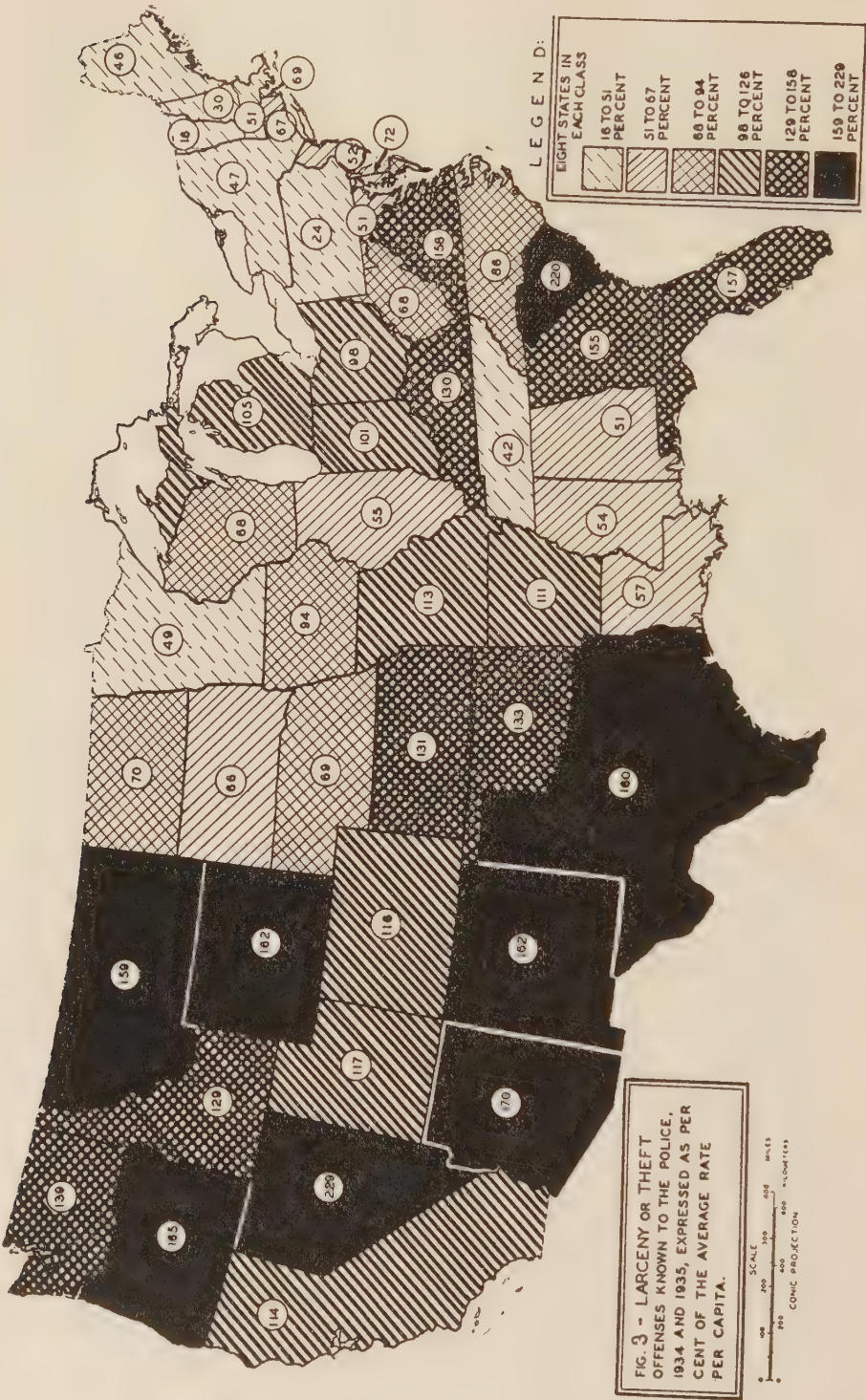
The pattern of the distribution of robberies shown in Figure 2 is not as consistently regional as is murder, but there is a definite gradient tendency. Rather than showing a concentration of class six states in the southeastern part of the country, this offense tends to group around a central axis running from east to west. Ten adjacent states in the middle central group are in classes five and six. A notable concentration is evident in the group of nine states running from Washington southeast to Texas, in the three heavier classes. There are no states in class one west of Wisconsin or south of Delaware and no states in class six east of Tennessee. That the concentration is central and western is shown by the fact that no class six state borders on Canada, the Atlantic Ocean or the Gulf of Mexico. An exception to the gradient is class one Wisconsin touching class six Illinois. There are several groups of states in gradient order. (1) Going north to south there are six states from New Hampshire to Tennessee; four states from Michigan to Tennessee; four states from Montana to Arizona. (2) from south to north there are four states from Georgia to Virginia; and three states from Nebraska to North Dakota. (3) Going west to east there are three states from Missouri to Colorado; and three states from Mississippi to Texas. The pattern of the distribution of robberies is essentially axial.

An opportunity to compare the distribution of robberies as shown by Federal Bureau of Investigation data with roughly comparable data compiled by an independent agency is afforded by statistics of the National Bureau of Casualty and Surety Underwriters. This private company writes more than 95 per cent of the bank robbery insurance in the United States.¹⁸ Bank robberies in 23 western states "have developed increasingly higher loss ratios in comparison with premium revenue, despite several increases in ratios given effect in recent years."¹⁹ "In 14 western states (Territory 4, see footnote 19) an insured bank must pay \$200 a year for the same insurance that a bank in New York State can buy for only \$10."²⁰ This private underwriter's statistics of robbery thus correspond generally, if not specifically, to the robbery rates of the Federal Bureau of Investigation.

¹⁸ *Am. Bankers Assoc. Jour.*, Vol. 26, August, 1933, "New Restrictions in Robbery Insurance."

¹⁹ *Ibid.*, These 23 states are divided into two territories, 3 and 4. Territory 3 contains Alabama, Arizona, California, Idaho, Louisiana, Mississippi, Montana, New Mexico, and Tennessee. Territory 4 contains Arkansas, Colorado, Illinois, Indiana, Iowa, Kansas, Minnesota, Missouri, Nebraska, North Dakota, Ohio, Oklahoma, South Dakota, and Wisconsin.

²⁰ *Ibid.*, November, 1933, "Protection," p. 52.



The distribution of larceny offenses in Figure 3 shows that this offense is concentrated in the western states. Seven of the eight states in class six are west of Texas, and six adjacent states in the New England and Middle Atlantic group are in class one. Sixteen adjacent states from the Pacific group east to Missouri and Kansas are in the three heavier classes. Although no class one state is adjacent to a class six state, there are six adjacent states in the central and Atlantic group in which all six classes are represented: Tennessee, Alabama, Virginia, Ohio, Kentucky, and South Carolina. Predominant gradients run from north to south: (1) Five states from South Dakota to Texas, three from Tennessee to Florida, three from Minnesota to Missouri, and three from Pennsylvania to Virginia. (2) One gradient from south to north is of three states from Louisiana to Missouri. (3) From east to west there are two gradients of six states each: from Tennessee to Arizona and from Alabama to Arizona. (4) A gradient going west to east is of three states from Alabama to South Carolina. The dominant states for this offense are thus concentrated in the west with the northeastern states having the lowest rates, but otherwise the distribution is more irregular than gradient.

Conclusion

It is evident from the correlations and the maps that three offenses are distributed in sectional regions: murder, assault, and robbery, because (1) all three distributions are sectional, that is, states of nearly equal rates occur adjacently, (2) all show gradients which are several states or more in length, (3) marked inconsistencies in the distributions are few. Murder and assault are oriented to the southeastern states as the dominant culture (crime) center, whereas robbery is oriented to a dominant axial grouping centering about the central and western states. The other three offenses, of which larceny is representative, show only slight tendencies towards regional distributions, the probable reason being, however, that per capita rates are not valid to describe such widely varied offenses. In other words, offenses against the person are regional when analyzed from rate per person data, while offenses against an infinite variety of property are not, but probably would be if the rates were calculated per unit of property.

The present investigation concludes that criminal phenomena, as an inter-related part of the general social life, have spatial regu-

larity over both metropolitan and sectional areas and are therefore regional. The crime region is an area in which offenses are distributed in a regular pattern emanating from an influential center, and its boundaries are delineated by the gradual change of the crime rate from the center to the boundary where the trend in an opposite direction begins.

It is submitted that one of the first steps in a program for the prevention of crime and the apprehension of criminals in the United States is the elementary procedure of dividing the country into natural regions of crime. The larger units would take into account sectional differences in culture, for areas of homogeneous culture would have common problems of crime control. But such sections would be comprised of coterminous metropolitan regions and not groups of adjacent states. The delineation of regional units on a detailed and empirical basis would continue down to the local community. Administrative agencies might then take advantage of patterns of movement and differences in culture. Official recognition would help further the integration of these agencies insofar as it gives sanction and facilitates the machinery of organization.

